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EFFECTIVENESS OF INCENTIVE CONTRACTS AS
MOTIVATORS

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NAVAL POSTGRADUATE SCHOOL

Monterey, California



THESIS

EFFECTIVENESS OF INCENTIVE CONTRACTS
AS MOTIVATORS

by

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and
Peter Atwood Shepard

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September 1973

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Effectiveness of Incentive Contracts as Motivators

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ABSTRACT

The authors investigated the effectiveness of incentive contracts as a tool to motivate contractors. They also studied several motivational theories to determine the feasibility of combining other motivational methods with incentive contracts.

The interview technique was used to determine the effectiveness of incentive contracts and the conclusions drawn led the authors to believe that motivational procedures could be applied to develop better government procurement contracts.

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I. INTRODUCTION

A. OBJECTIVES

Government procurement is an extremely complex discipline involving many detailed areas. In their investigation of this subject, the authors concentrated on incentive contracts, a small portion of the procurement process. The primary objective of this thesis was to determine the effectiveness of incentive contracts as motivators for government contractors. A secondary objective was to examine the usefulness of motivational theorists' methods in incentive contracting. In the event that such motivational theories proved fruitful, the authors intended to recommend refinements to the incentive contracting process.

B. BACKGROUND

In FY 1972, the United States Government spent approximately fifty-six billion dollars in procuring goods and services to run current programs.¹ The majority of this amount was in connection with national defense which totaled 13.5 billion dollars in the Navy alone.² This procurement

¹ Judson, R., Deputy Director of the Commission on Government Procurement, Address at the Naval Postgraduate School, 18 July 1973.

² Survey of Procurement Statistics, p.2, Department of the Navy Headquarters Naval Material Command, June 1972.

spending is astronomical when compared to the 15 billion dollar total defense budget of the late 1940's.³ Though there have been budget cutbacks in recent years, there has been an annual increase of the dollar amount allocated for defense spending. While the dollar amount has increased, the defense portion as a percentage of the annual budget has declined from 40.8% in FY 1970, to 31.8% in FY 1973.⁴ The real problem has been that this decrease has resulted in fewer weapon systems procured with higher cost per system, at a time when more systems are needed. Congress has continued to observe these procurements with dissatisfaction as these costs have increased and has emphasized that the government cannot continue to operate its defense policy with these astronomical procurement costs. There has been evidence that DOD has needed to tighten its spending and management control and yet costs have continued to rise.

1. Review of Contracting and Procurement Procedures

Inflation can be blamed for part of this increased procurement cost, but the authors feel that more direct causes have been the "gold-plating" and inefficient procurement practices. Gold-plated items are nice to have features which are unnecessary for the performance of the intended mission

³ Halperin, M. H.; "The Evolution of American Military Strategy," in Smith, M. E., III and Johns, C. J., Jr. (ed.), American Defense Policy, 2d ed., p. 176, The Johns Hopkins Press, 1968.

⁴ The Budget of the United States Government Fiscal Year 1973, p. 75, U. S. Government Printing Office, Washington, 1972.

of the weapon system. Admiral Kidd, Chief of Naval Material, has voiced his opinion on numerous occasions that weapon systems which are effective, of simple design, easily maintainable, and highly reliable are needed.⁵ These sentiments have been reiterated by many other individuals throughout the government, with well-founded concern.

The government has needed to write contracts which result in systems which meet mission specifications and yet cost less. To accomplish this, the contractor must be encouraged to become more efficient. The government must ensure that there is less "gold-plating" and that the product which the government desires is developed at less cost. Efficiency will become a greater must in the future.

While many government personnel have recognized that efficiency has become a necessity, not enough has been done to improve, with the result that DOD procurement has become the center of much criticism. Certainly DOD has not done any worse job of procurement than other government agencies, but since it has spent the most, it has naturally been in the spotlight.⁶ DOD has had its resident critics who have attacked

⁵ Kidd, I. C., Jr., Chief of Naval Material, "The Three R's: Reliability, Responsibility, and Reason," address to the Naval Air Systems Command's Monthly Luncheon, Fort Myer Officer's Club, 16 February 1972, Readings in Acquisition Management for Period of 1969 to 1972, Compiled by CDR DeMayo, P., pp. 603-622, Naval Postgraduate School Print Shop, June 1972.

⁶ Bell, H., Deputy Director Procurement and System Acquisition Division GAO, Address at the Naval Postgraduate School, December 1972.

the problems of existing procurement policies, criticizing the manner in which procurement has been handled, but have proposed no real solutions.

Members of Congress have criticized DOD procurement policy. Their views have been against the expenditure of funds in many phases of procurement with their main concern being overruns. Naturally, when overruns have been aired--whether due to inflation or otherwise--the news created has resulted in criticism of DOD. Little if any of this criticism has been constructive and, unfortunately, the net result has been such an elaborate system of checks and balances that Project Managers spend an inordinate amount of time appeasing this bureaucratic might and cutting red tape. Defense against outside criticism has become a way of life within DOD, and has sapped efforts to alleviate the real problem of inefficiency in procurement practices.

The Congress has been so concerned with procurement problems that in 1969 it created a Congressional Commission on Government Procurement. The report by this commission has recently been completed.

The Commission on Government Procurement was created by Public Law 19-129 in November 1969 to study and recommend to Congress methods "to promote the economy, efficiency, and effectiveness" of procurement by the executive branch of the Federal Government. The products of more than a year's intensive work by the study groups were presented to the Commission in reports totaling more than 15,000 pages and 149 recommendations.

⁷ Commission on Government Procurement, Summary of the Report of the Commission on Government Procurement, pp. III-IV, U. S. Government Printing Office, December 1972.

As indicated in the Report of the Commission on Government Procurement, many new schemes, particularly in the contracting area, have had their rise and fall. It has also been customary to institute change when new personnel assume positions in DOD. The attempt has been to provide new guidelines when the old ones haven't even been fully understood.⁸ Every new head seems to have had the illusion that he must make a name for himself and therefore changes existing policy. There is nothing wrong with changing a poor system to improve it, but all too often change has occurred without adequate consideration of what was indeed wrong with the old system.

Contracting has undergone several changes during the past ten years. Total Package Procurement (TPP)--one contract for both development and production--which saw its major downfall with the C-5A, has been out of vogue for several years, although the original concept of preventing "buy-ins" seemed good. Original contracting schemes visualized two extremes, the firm fixed price (FFP) at one end and the cost plus fixed fee (CPFF) at the other end. The FFP type contract has placed the entire burden of risk on the contractor, whereas the CPFF contract has placed the entire burden of risk on the government. Though these types of contracts have had

⁸ Frosch, R. A., Assistant Secretary of the Navy for Research and Development, Address at the Sixteenth Annual Institute on Government Contracts, George Washington University/Federal Bar Association, Washington, D. C., 8 May 1969, Readings in Acquisition Management for Period of 1969-1972, Compiled by CDR DeMayo, P., pp. 325-345, Naval Postgraduate School Print Shop, June 1972.

their place, between them a myriad of other contracts have sprung up which have included fixed price plus incentive fee (FPI) and cost plus incentive fee (CPIF). In DOD directive 5000.1, the government made progress by attempting to fit the appropriate type of contract to the procurement phase. Essentially this meant breaking the procurement into (1) a development contract whereby a cost-incentive contract should be used and, (2) a production contract which should usually be a fixed price contract. Rare has been the case when the development contractor has not been awarded the production contract. Thus contracting has proceeded from the "buy-ins" to TPP to a two stage TPP where the contractor "buys-in" during the development phase and gets well during the production phase. The latest in contractual development has been the Award Fee which has attempted to provide the Contractor with timely reinforcement based upon some pre-determined achievement. How effective the Award Fee will be is yet to be determined, but the prospects appear bright.

2. Incentives and Incentive Contracts

The authors have begun by focusing on contracting, and before being accused of being resident critics, will continue into incentive contracts, after a brief statement of why they became interested in this subject area.

As students in the System Acquisition Management curriculum, the authors have had many opportunities to study the preceeding ideas. Their interest was particularly aroused by the views of the Honorable Robert A. Frosch. The following excerpt taken from his address at the sixteenth annual Institute

on Government Contracts, May 8, 1969, was perhaps a major stimulus for this thesis.

Now I come to incentives. Do we really know what it is we are incentivizing when we write an incentive? Incentives are statements to the contractor that say that if you are a good boy and do well on the difficult parts you get more money, and if you do badly you get less money, and in the end, you may, in fact, lose your shirt (depending on how the contract is construed).

The thing that worries me about incentives is that we are assuming that incentives are identical to motivation, and that, in fact, by adjusting the dollar values of incentives, we have very fine control over the motivations of the people who are actually doing the job. I don't know of any direct experimental evidence that suggests that this is really right and I doubt it. It is almost certainly not right down to the level of fine control. I think we ought to find out more about it. I think it would be very useful to try and find out exactly what the effects of certain incentives are, not on the overall performance of the contract, but on what actually happens inside the manufacturer. The probable effect of incentives on the manufacturing company is to give it a rather more complicated framework inside which it can optimize its problems. If we are not very careful about putting in the incentives, the manufacturer may very well be motivated to do the wrong thing. He wants to operate in the incentive structure to maximize profit. We want him to operate in the incentive structure to produce an object which is most like our desires. The two are not necessarily the same thing.⁹

With this statement as the seed, the authors pursued other articles, case studies, and queried numerous individuals in an attempt to ascertain the validity of Dr. Frosch's views on this matter.

With this background the focus has narrowed down to incentive contracts. Perhaps the most widely accepted reasons for the existence of incentive contracts are:

⁹ Ibid..

(1) Incentive contracts promote efficiency since they are intended to encourage the profit-minded contractor to cut costs in order to make a greater profit, and since the government saves a portion (depending on the share ratio--percent of cost shared by government/contractor, e.g., 90/10) of every dollar below target cost, both will benefit.

(2) Incentive contracts are implicitly intended to be a means of risk sharing. With a firm fixed price contract, the contractor has all of the risk, which is good for the government. Under a cost plus fixed fee contract, the government has all the risk. The fixed price incentive fee contract and cost plus incentive fee contract have provided a wider range of alternatives and varied degrees of risk to each party.

The effectiveness of incentives has been the big question. Dr. Frosch has questioned this fact¹⁰, and statistical studies by the Rand Corporation¹¹ and by Commander Max Dixon¹², to mention two, have shown no conclusive evidence that incentives have been effective or that incentives even accomplish what they were intended. As Professor Raymond G. Hunt, Professor of Psychology, State University of New York

¹⁰ Ibid..

¹¹ Rand Corporation Report RM-5120-PR, Cost Incentives and Contract Outcomes: an Impirical Analysis, by Fisher, I. N., September 1966.

¹² CDR Dixon, M. W., A Statistical Analysis of Deviations from Target Cost in NAVAIRSYSCOMHQ Fixed-Price Incentive Contracts During the 1949-1965 Time Frame, M. S. Thesis, Naval Postgraduate School, Monterey, California, March 1973.

at Buffalo, has indicated, perhaps incentives have been misnomers and should have been called variable profit with the CPFF being a special case where the variable profit has been fixed.¹³

To arm themselves for the research effort, the authors studied numerous psychological theories concerning incentives as motivators. With these theories as a basis, the authors formed their preliminary opinions, namely: one, that the incentives used should motivate a contractor to do a better job, and, two, that the contractor should treat incentive contracts differently than fixed price contracts.

3. Motivational Theories

Since Elton Mayo conducted studies at the Hawthorne Works (Chicago) of the Western Electric Company (1927-1932), giving the human relations school its start,¹⁴ almost everyone has jumped on the motivation band wagon. The theories are plentiful and many are appealing.

There is widespread agreement among the theorists that incentives do not, in fact, motivate, but rather they move an individual to act a certain way. One source pointed out that to a manager the difference is purely academic. The general consensus was, however, that when an employer offers

¹³ Hunt, R. G., "Extra-Contractual Incentives in the Award Fee," Address at the School of System and Logistics Air Force Institute of Technology Wright-Patterson AFB, Ohio, 23-24 February 1972, Proceedings DOD Procurement Symposium: Progress and Research in the Seventies, p. 75-110, February 1972.

¹⁴ Wassenaar, D. J. and Oestreich, H. H., The Hawthorne Studies, A Summary and Critical Evaluation, San Jose State College, San Jose, California, The Lansford Publishing Company, 1972.

financial inducements to his employees, he is trying to change the employee's behavior, i.e., he is trying to teach him a new habit.¹⁵

A few of the most widely accepted behavior theories will be discussed now.

a. A. H. Maslow¹⁶

Maslow looked at the needs of an individual and contended that man attempts to satisfy needs in the following ascending (1 to 5) order:

- (1) Physical needs (food and water)
- (2) Safety needs (shelter, threat on or off the job)
- (3) Social needs (need to associate, to belong)
- (4) Egotistic needs (to obtain respect)
- (5) Self-actualization (the desire to become everything that one is capable of becoming)

b. Frederick Herzberg¹⁷

Herzberg's satisfier/dissatisfier theory is widely recognized and practiced. In short, Herzberg claims that the many factors which affect workers' attitudes can be divided into two groups. The satisfiers are those factors which promote feelings of job satisfaction and include such things as recognition, achievement, work itself, responsibility, possibility

¹⁵ Rothe, H. F., "Does Higher Pay Bring Higher Productivity?" in Sutermeister, R. A. (ed.), People and Productivity, p. 257-265, McGraw-Hill Book Company, Inc., 1963.

¹⁶ Wallace, J., Psychology: A Social Science, p. 108, W. B. Saunders Company, 1971.

¹⁷ Herzberg, F., Mausner, B., and Snyderman, B. B., "Motivation Versus Hygiene" in Sutermeister, R. A. (ed.), People and Productivity, p. 492-497, McGraw-Hill Book Company, Inc., 1963.

of growth, and advancement. The dissatisfiers are those factors that do not by themselves promote job satisfaction, but if not present, they can lead to job dissatisfaction. They include such factors as pay, steady employment, early retirement, financial security, satisfactory home life, and technically qualified supervisors.

c. Victor Vroom¹⁸

Vroom's theory is most attractive to the authors. He contends that the strength of a person's desire or aversion for "something" is based not on its intrinsic properties, but on the anticipated satisfaction or dissatisfaction associated with other outcomes to which they are expected to lead. That is to say, means acquire attractiveness as a consequence of their expected relationships to ends.

d. J. W. Atkinson¹⁹

Atkinson's risk-taking theory falls close to the behavioral theory of Vroom in the authors' opinion. He contends that risk-taking involves a motive, an expectancy, and an incentive. Instead of attaching positive or negative valences to an outcome, Atkinson speaks of motivation to succeed and motivation to avoid failure, which essentially boil down to the same thing as positive or negative valences.

¹⁸ Vroom, V. H., Work and Motivation, p. 14-28, John Wiley & Sons, Inc., 1967.

¹⁹ Wallace, J., Psychology: A Social Science, p. 147-150, W. B. Saunders Company, 1971.

e. Helen Peak²⁰

Helen Peak, in an article entitled "Attitude and Motivation," pointed out that there is no limit to the environmental variables that might be used to change attitudes. She said:

To change attitudes we must remember the chemist who would not think of using the same reagent in order to alter the structure of a molecule of sodium chloride as he would to change a protein molecule. We too need to refine our reagents and select them in the light of the structure with which we are working.²¹

Not long after Hawthorne, Chester Barnard, the President of the New Jersey Bell Telephone Company, wrote a book which set forth his belief that any organization secures the services of its employees by the incentives it offers them.²² The incentives that have received the greatest emphasis are the material inducements since they are easiest to produce and therefore offer. In 1960, Harold Rothe wrote an article entitled "Does Higher Pay Bring Higher Productivity?" At that time, in practically all companies, the preferred method of inducing employees to work faster, or better, or both, was to offer them more money.²³

²⁰ Peak, H., "Attitude and Motivation," in Cummings, L. L. and Scott, W. E., Jr., Readings in Organizational Behavior and Human Performance, p. 159-166, Richard D. Irwin, Inc., and the Dorsey Press, 1969.

²¹ Ibid...

²² Dowling, W. F., Jr. and Sayles, L. R., How Managers Motivate: The Imperatives of Supervision, p. 7, McGraw-Hill Book Company, 1971.

²³ Rothe, "Does Higher Pay Bring Higher Productivity?", op. cit., p. 257.

Incentive systems are recorded as having been used as early as 400 B. C. by the Chaldeans and probably by the Romans in the first century A. D..²⁴ There is remarkably little experimental evidence to prove that incentive systems of any type actually work. Labor unions claim that their use is declining, but as of 1963, from 25 - 30% of workers in U. S. industry were estimated to be covered by incentives.²⁵ In the United Kingdom, 42% of wage earners were on "payment by results" in 1961.²⁶

²⁴ Sills, D. L. (ed.), International Encyclopedia of the Social Sciences, v. 7, p. 248-249, Macmillan, 1968.

²⁵ Ibid...

²⁶ Ibid...

II. NATURE OF THE PROBLEM

The existence of two distinctive types of contracts has generally been recognized. On one end of the spectrum has been the firm fixed price contract and on the other end has been the cost plus type of contract.²⁷ With fixed price contracts, the fee has been determined as the difference between cost to produce an item and the agreed price. The burden has generally been on the Contractor under this type of contract to keep cost as low as possible in order to earn as much fee as possible. A modification to this type of contract has resulted in the fixed price plus incentive fee contract which has combined the features of cost-price differential and some fee called an incentive. The other distinctive contract type, cost plus, places the Government in a somewhat disadvantaged position. The Government pays for the development and production cost, until they greatly exceed target cost, and then awards the contractor an "incentive fee" in accordance with a pre-arranged scheme upon completion of the work. The "incentive fee" is variable in the FPI and CPIF cases with a more specific case being the cost plus fixed fee where the fee is fixed. Thus a more accurate description of our so-called

²⁷ Harbridge House Inc., Basic Graphics for Incentive Contracting, p. 1, Harbridge House Inc..

"incentive contracts" would be "variable fee contracts." Just from the name "incentive contract," one can easily be trapped into expecting something special to result from its use.

Robert S. Opsahl and Marvin D. Dunnette in their article, "The Role of Financial Compensation in Industrial Motivation," have defined incentive as "an object or external condition, perceived as capable of satisfying an aroused motive, that tends to elicit action to obtain the object or condition."²⁸ Used in this context, incentive contracts have had the implication of being motivators to contractors. That is, contractors given an incentive type contract are motivated to do a better job and gain some incentive. At first glance, this should appear logical. Given a 70/30 share line on an incentive type contract, a contractor would be expected to cut cost below target cost since he would receive 30 cents on every dollar saved. Upon closer scrutiny, it can be shown that a contractor might be motivated to purchase new equipment and allocate that cost to the current government contract where the government will pay 70 cents of every dollar that the new equipment costs (assuming the contractor can convince the government that the equipment is necessary for the existing project). There has also been the claim that contractors purposely indicate a high target cost in order to enhance the

²⁸ Opsahl, R. S. and Dunnette, M. D., "The Role of Financial Compensation in Industrial Motivation," in Cummings, L. L. and Scott, W. E., Jr., Readings in Organizational Behavior and Human Performance, p. 499-527, Richard D. Irwin, Inc., and the Dorsey Press, 1969.

chance of a large fee. The preceding views are based upon the assumption that all contractors are profit motivated.

Generally, it has become an accepted fact that all companies have been profit motivated in the long run just for existence. Short run company objectives, however, can vary in as many ways as there are companies. Thus, in the short run, contractors have bid on government contracts with the single purpose of contributing to National Defense and have disregarded any possible profit that could be earned on the contract. The contractor may have performed superbly with the underlying purpose of acquiring future government contracts. In this case, the true incentive was the acquisition of future contracts and not the possible profit that could have been earned during the current contract. From this hypothetical case, the question has arisen, given an incentive contract, have contractors been motivated by the monetary incentive which the government has offered? Taking the incentive offered by the government one step further, does the contractor attempt to do anything with this incentive to motivate his personnel to perform better?

Typical cases might be described indicating that profit is not the only incentive present in government contracts and, in fact, the incentive fee is only a true incentive when the short-run objective of a company is profit maximization.

The preceding discussion in essence asks the question, is money the best incentive to offer the contractor and likewise, is it the best incentive for a contractor to offer his personnel?

Several statistical analyses have been conducted with regards to incentive contracts, but results of these studies are contradictory. After an in depth analysis of deviation from target cost in Naval Air Systems Command Headquarters (NAVAIRSYSCOMHQ), fixed-price incentive contracts during the 1949-1965 time frame, Max Wayne Dixon concluded, "It would seem prudent, lacking supportive evidence, to not place such dependence on incentive contracting to influence efficient contractor performance."²⁹ While the authors cannot support their opinion, they believe that statistical analysis of incentive contracts fall into the same trap as do the similar studies of individual incentive systems. The individual incentive systems also lack supportive statistical evidence that they work, but many of the individual incentive systems fail because of improper implementation and not because of the shortcoming of the incentive.³⁰ At lower levels in a company, there is no reason why a monetary incentive should not work.

It seems likely that much of the "negative data" associated with incentive contracts are due to improper use of the tool rather than to having a faulty tool.

If Maslow's need hierarchy theory is accepted, the five need levels described by Maslow can be roughly correlated with

²⁹ Dixon, A Statistical Analysis of Deviation from Target Cost in NAVAIRSYSCOMHQ Fixed-Price Incentive Contracts During the 1949-1965 Time Frame, op. cit., p. 51.

³⁰ Rothe, "Does Higher Pay Bring Higher Productivity?," op. cit..

the individuals in the various levels of an organization.³¹

The blue-collar labor force of a company is concerned with fulfilling the physiological and security needs. This means their main concerns are with food, clothing, shelter, and security for themselves and their families. At this level, monetary incentives would seem to be useful in order for these people to satisfy their needs. Moving upward in an organization, for most people pay remains of key importance-- up to a certain dollar amount. However, needs become more oriented toward other things such as job satisfaction.³²

The source of job satisfaction tends to shift to the work itself, and the need for respect and recognition by fellow employees. Project managers who have spoken at the Naval Postgraduate School have emphasized that they feel their main satisfaction comes from the challenge of the position, the esteem, and the recognition by peers and executives alike that they have done a good job. To many, this has seemed to be more important than the pay itself. To managers at the top level of a company, respect and recognition have remained important. However, self-actualization, that is, becoming everything that one is capable of becoming, has become the true incentive. At this level, for most persons, the basic needs have long been submerged and these higher needs provide

³¹ Porter, L. W. and Lawler, E. E., III, "Properties of Organization Structure in Relation to Job Attitudes and Job Behavior," in Cummings, L. L. and Scott, W. E., Jr., Readings in Organizational Behavior and Human Performance, p. 402-433, Richard D. Irwin, Inc., and the Dorsey Press, 1969.

³² Ibid...

their incentive. Just as people at various levels of organizations have needs which motivate them, organizations have needs which motivate them. These needs vary from organization to organization and, indeed, vary for any one organization over time.

Government aims have not necessarily always coincided with those of government contractors, thus, what the government perceives as an incentive to a contractor does not necessarily coincide with what will actually motivate the contractor in the way desired by the government.

III. EXPERIMENTAL PROCEDURE

A. INITIAL APPROACH

The authors' initial approach to collect research data with regards to the effectiveness of incentive type contracts was, as indicated previously, primarily influenced by the Honorable Robert Frosch. To reiterate what he viewed as being an important point:

. . . I think it would be very useful to try and find out exactly what the effects of certain incentives are, not on the overall performance of the contract, but on what actually happens inside the manufacturer . . .³³

The authors felt that another statistical study comparing target cost and target fee with actual cost and actual fee, would simply be covering trodden ground, and as other studies have been inconclusive, would probably serve no useful purpose. In this connection, most of the articles researched by the authors concentrated on the individual, the group, or collective systems (see Appendix A for a brief description of these systems), almost totally avoiding the subject of organizations. In order to test these incentive systems, it would have been necessary to investigate the blue collar or working level of a company. Furthermore, drawing an analogy from the authors'

³³ Frosch, R. A., Assistant Secretary of the Navy for Research and Development, Address at the Sixteenth Annual Institute on Government Contracts, George Washington University/Federal Bar Association, Washington, D. C., 8 May 1969, Readings in Acquisition Management for Period of 1969 to 1972, Compiled by CDR DeMayo, P., p. 341, Naval Postgraduate School Print Shop, June 1972.

own practical experience in aviation squadrons, the Commanding Officer of an aircraft squadron could have a "motivation factor" of 99.5 on a 0-100 scale; however, if the maintenance man responsible for inflating the tires is not motivated to complete his assigned tasks, the aircraft are not going to fly. Therefore, it is of the utmost importance in any organization to determine what actually occurs within the organization with regard to incentives and motivational programs. As a result, it was decided that a close scrutiny of the motivational systems of various corporations would be the optimum place to commence research.

As a vehicle to measure the effectiveness of various motivational systems, the authors selected and intended to use the Department of the Navy, Office of Civilian Manpower Management (OCMM), motivational questionnaire (see Appendix B) which was developed by Mr. Si Masse, Evaluation Branch, OCMM main office, Washington, D. C., for use in evaluating government Civil Service employees. With his permission and through his efforts, the authors intended to administer this questionnaire and have it scored at the OCMM home office with the results returned to the authors and in turn to the evaluated corporation. The authors hypothesized that a correlation between the scores obtained through the use of the OCMM questionnaire and the reputation of the subject company, good or bad, would exist. The procedure for obtaining the company's reputation would be a combination of statistical studies of past performance on government contracts and extensive interviews with Defense Contract Administration

Services (DCAS) personnel in addition to any other information deemed significant or necessary to make such a subjective determination. The authors envisioned successful substantiation of their hypothesis and planned to follow with a recommendation for development of an instruction similar in nature to DOD INST 7000.2, but dealing with motivational programs. There was the realization that such an instruction would, of course, require periodic administration of the OCMM questionnaire for a company to maintain its verification as having an effective employee motivational environment. It was felt that a work force scoring high on the OCMM questionnaire would render better all around contract performance for the government.

B. FAILURE OF THE INITIAL APPROACH

With this initial approach, the authors' primary concern had been the problem of obtaining the questionnaire itself. As indicated previously, Mr. Masse solved the problem of permission to use the questionnaire. The questionnaire was obtained through the extensive and much appreciated cooperation of Mr. Donald West, Regional Office of Civilian Manpower Management, San Francisco, California. Interviews with Defense Contract Administration Service personnel offered no opposition to this research approach. The final link, however, of actual administration of the questionnaire proved to be the stumbling block. The authors had selected a corporation with a good reputation as the first sample. After thorough discussion of the minute details of questionnaire administration, satisfactory arrangements were made. The real problem came when

the questionnaire was discussed at the corporate level where the question arose, "If the results of this questionnaire make us look bad, can these data possibly be used against us in future government contract awards?" Although the authors assured the corporation that it would not be connected in any way with the data and that the answer sheets would be destroyed following the compilation of the data, the climate was suddenly altered. Instead of being treated as two thesis students, the authors were now treated as "the government" and the corporation assumed the role of "contractor." The authors' proposal, and, indeed, they themselves, could no longer be trusted. The authors feel that "trust" between the government and contractors could be the topic for an entire thesis and thus will not be discussed in this composition. Suffice it to say, that the questionnaire was not administered and that this air of distrust was one of the major reasons for the failure of this initial approach.

The second type of failure indicated two shortcomings which will be discussed here, although the authors recognize that others may exist. The first shortcoming hinges on the engagement/involvement question. Prior to commencing the research effort, the authors had listened to several guest lecturers at the Naval Postgraduate School who indicated that in order for the government to get what it desired, it must motivate the head of the corporation and let him be concerned with the motivation of his managers and work force within the corporation. The authors recognized that such an approach had, in fact, been the intent of the government up to the present

time, but felt that this approach is not necessarily the only way or the best way to accomplish the objective of successful contract completion. After considerable thought and discussion, the authors now feel that the OCMM questionnaire administration approach would have, in fact, resulted in too much involvement in corporate affairs.

The second shortcoming falls into a category which the authors have termed as "defeating the purpose." It has long been recognized that government contractors have generally done their best to give the government whatever the contractor has perceived that the government wants, as the contractors have wanted to stay in the government's good graces.³⁴ There is little doubt that the initial approach would create in the government contractors the perception that what the government wants is more emphasis on motivation. The results of such an increased motivational program effort on the part of a contractor which was encouraged by the government would very likely result in increased cost to the government due to greater overhead costs.

C. FINAL APPROACH

At the outset, the authors were surprised to find that the incentive fees associated with government contracts were not further allocated to all levels within corporations. With this startling fact, they felt that it would be interesting to discover whether such was the practice in other corporations.

³⁴ Ibid...

In keeping with the initial theme, "what happens inside the corporation," the authors felt that several other questions were extremely pertinent.

(1) What sort of motivational programs are used by various corporations?

(2) Do these programs differ greatly from corporation to corporation?

(3) Who sounds the alarm when a certain project is rapidly approaching and will apparently surpass target cost?

(4) Is there a conscientious program of trade-offs designed to maximize profit?

(5) What gives the corporation project manager the greatest amount of satisfaction? In other words, what motivates him?

(6) Does a different type of contract warrant different treatment from the corporation's point of view or are all contracts administered alike internally?

By this point in their research effort, the authors were somewhat skeptical of placing all of their faith in a questionnaire, having experienced prior failure in implementing the use of such a vehicle, and, therefore, decided to utilize the interview technique. This approach allowed the authors to consider the amplifying remarks made during such interviews. This technique also allowed the researchers to take full advantage of the Systems Acquisition Management Seminar program at the Naval Postgraduate School. The authors were able to query several high ranking civilian procurement specialists, heads of corporations, as well as some very successful project managers from both civilian corporations and from government

projects. In addition, several corporations were visited where interviews were conducted with project managers, controllers, industrial relations managers, and contract officers. The results of these interviews, in addition to conditions observed in the various corporations, have served as the basis for data collected and upon which the authors' recommendations and conclusions were formulated.

IV. PRESENTATION OF DATA

A. INTRODUCTORY COMMENTS

In the collection of data through interviews, specific names and dates were kept; however, it was determined that for the purposes of this thesis, the individuals' names as well as the names of the corporations were usually not pertinent. In some cases, answers were sensitive and revealing the names could result in hardship for the individual.

The data will be presented by a statement of the question with the individual's responses following. A section of amplifying comments will then conclude the data section. Thirty-five persons were interviewed from seven companies, the Government Accounting Office, Armed Services Procurement Regulations Committee, Commission on Government Procurement, Navy Project Managers, and Naval Postgraduate School Faculty. Interviews lasted from thirty minutes to four hours. After the first few interviews, the authors found that not every question was pertinent to every individual's job, thus only those questions which were pertinent to the individual being interviewed were asked. As a result, not every question will be followed by the same number of responses, but each response will be identified by the individual (1, 2, 3, . . .), the individual's organization (A, B, C, . . .), the individual's position (e.g., Controller), and the individual's response.

B. DATA

1. Are incentives from incentive contracts passed down to lower levels (blue collar) in the organization?

<u>INDIVIDUAL</u>	<u>COMPANY</u>	<u>POSITION</u>	<u>RESPONSE</u>
1	A	Industrial Relations	NO
2	A	Industrial Relations	NO
3	A	Contract Officer	NO
5	E	President	NO
6	B	Project Manager	NO
7	B	Project Manager	NO
8	B	Contract Officer	NO
9	B	Contract Officer	NO
10	B	Controller	NO
11	B	Controller	NO
12	C	Industrial Relations	NO
13	C	Training	NO
14	C	Controller	NO
15	C	Controller	NO
16	C	Contract Officer	NO
17	C	Contract Officer	NO
18	C	Vice President, Development	NO
19	GAO	Director Military Acq.	NO
20	D	Contract Officer	NO
21	*	Deputy Director	NO
22	**	Contract Officer	NO
23	USN	Navy Project Manager	NO

<u>INDIVIDUAL</u>	<u>COMPANY</u>	<u>POSITION</u>	<u>RESPONSE</u>
24	***	Instructor	NO
25	***	Instructor	NO
26	USN	Navy Project Manager	NO
27	F	President	NO
29	USN	Chairman, Aspr Committee	NO

* Commission on Government Procurement

** Navy Regional Procurement Office, Los Angeles

*** United States Air Force Academy

2. Who sounds the alarm if a project is about to encounter a cost overrun?

<u>INDIVIDUAL</u>	<u>COMPANY</u>	<u>POSITION</u>	<u>RESPONSE</u>
1	A	Industrial Relations	NO RESPONSE
2	A	Industrial Relations	NO RESPONSE
3	A	Contract Officer	Project Manager
6	B	Project Manager	Project Manager
7	B	Project Manager	Project Manager
8	B	Contract Officer	NO RESPONSE
9	B	Contract Officer	Project Manager
10	B	Controller	Project Manager
11	B	Controller	Project Manager
14	C	Controller	P.M./Controller
15	C	Controller	P.M./Controller
20	D	Contract Officer	Project Manager
21	*	Deputy Director	Project Manager
23	USN	Navy Project Manager	Project Manager
26	USN	Navy Project Manager	Project Manager
29	USN	Chairman, Aspr Committee	Project Manager

<u>INDIVIDUAL</u>	<u>COMPANY</u>	<u>POSITION</u>	<u>RESPONSE</u>
30	C	Project Manager	Project Manager
* Commission on Government Procurement			

3. Is there a conscientious program of trade-offs designed to maximize profit within your company?

<u>INDIVIDUAL</u>	<u>COMPANY</u>	<u>POSITION</u>	<u>RESPONSE</u>
1	A	Industrial Relations	DID NOT KNOW
3	A	Contract Officer	DID NOT KNOW
6	B	Project Manager	NO
7	B	Project Manager	NO
8	B	Contract Officer	NOT CONCERNED
9	B	Contract Officer	NOT CONCERNED
10	B	Controller	NO
11	B	Controller	NO
14	C	Controller	NO
15	C	Controller	NO
16	C	Contract Officer	DID NOT KNOW
17	C	Contract Officer	DID NOT KNOW
30	C	Project Manager	YES

4. Does a different type of contract warrant different attention, or are all contracts treated in a similar manner administratively?

<u>INDIVIDUAL</u>	<u>COMPANY</u>	<u>POSITION</u>	<u>RESPONSE</u>
3	A	Contract Officer	ALL SAME
6	B	Project Manager	ALL SAME
7	B	Project Manager	ALL SAME

<u>INDIVIDUAL</u>	<u>COMPANY</u>	<u>POSITION</u>	<u>RESPONSE</u>
8	B	Contract Officer	ALL SAME
9	B	Contract Officer	ALL SAME
10	B	Controller	ALL SAME
11	B	Controller	ALL SAME
14	C	Controller	ALL SAME
15	C	Controller	ALL SAME
16	C	Contract Officer	ALL SAME
17	C	Contract Officer	ALL SAME
21	*	Deputy Director	ALL SAME
22	**	Contract Officer	ALL SAME
23	USN	Navy Project Manager	ALL SAME
26	USN	Navy Project Manager	ALL SAME
29	USN	Chairman, Aspr Committee	ALL SAME

* Commission on Government Procurement

** Navy Regional Procurement Office, Los Angeles

5. What do you consider the best incentive or motivator for the blue collar worker?

<u>INDIVIDUAL</u>	<u>COMPANY</u>	<u>POSITION</u>	<u>RESPONSE</u>
1	A	Industrial Relations	MONEY
2	A	Industrial Relations	MONEY
6	B	Project Manager	MONEY
7	B	Project Manager	MONEY
12	C	Industrial Relations	MONEY
14	C	Controller	DID NOT KNOW
15	C	Controller	DID NOT KNOW
28	G	Safety Officer	MONEY
30	C	Project Manager	MONEY

6. What gives the Corporation Project Manager the greatest amount of satisfaction, in other words what motivates him? (Only a limited number of Project Managers were available for interview.)

a. Individual 6, Company B, Project Manager, response: Of course pay and promotions are important, but the real driving force is the personal satisfaction that I have done a good job. Even if I bring a project in over target cost, but know that I have done as well as possible, I am still personally satisfied.

b. Individual 7, Company B, Project Manager, response: In my opinion, all good Project Managers are egotists. The pay, promotions and other benefits will automatically follow if I satisfy myself. After all I know more about what is important than my superiors.

c. Individual 23, USN, Navy Project Manager, response: Job satisfaction.

d. Individual 26, USN, Navy Project Manager, response: Personal pride. If you strive to attain the capability to be able to beat someone like yourself, you will never have any problems, because you are the best.

e. Individual 30, Company C, Project Manager, response: There are easier jobs with the same or even better pay, but few offer the rewards associated with being a successful Project Manager.

f. Individual 31, USN, Navy Project Manager, response: This is my final tour and I have attempted to do a good job for my personal satisfaction.

7. Other pertinent comments.

a. Individual 1, Company A, Internal Relations, Comments: Psychological theories are tremendous in theory, but when put to use in the real world seem to have problems. Incentive systems run into problems with the unions who tend to strive for mediocrity. For now, union personnel advancement depends upon performance, and individuals are reported on depending on how well they are doing.

b. Individual 3, Company A, Contract Officer, Comments: The incentive offered by the government is viewed as profit, and is not passed down to the individuals within the corporation.

c. Individual 5, Company E, President, Comments: With government contracts there is too much written reporting and not enough physical involvement. We, the contractor, will still run our business to make money and companies can make money if they are efficient. In fact, there is opportunity to make good money even with all the emphasis on restricting profit. A FPI contract with a 75/25 or a 85/15 share ratio is not a very good incentive and if the contractor sees an underrun, he will spend to build himself up. Motivators include promotions, training programs, and incentive plans based on profit for top management. Buy-ins will never stop unless you let the chips fall.

d. Individual 6, Company B, Project Manager, Comments: The best incentive for the blue collar worker is good pay, closely followed by the personal interest of high ranking officials of the organization. He indicated that a walk

through the working areas of the company by the company president was one of the better incentives. He personally used the letter-of-appreciation approach to recognize and, therefore, foster continued superior performance. He felt that incentives, from the government's point of view, was nothing more than insurance that the company would perform. He stressed the importance of not losing the entire schedule at one time and then suggested that the government might try incentivizing its own people. He indicated that he knew when impending overruns were present before others in the corporation. He was not aware of any conscientious program of profit maximization through trade-offs on a corporate level; however, he felt that profit was a corporate goal and, therefore, was concerned with profit maximization at the project level. At this level, with the aid of an assigned controller assistant, he was aware of the impact of trade-off decisions on profit and thus acted accordingly. He went on to assert that award fee contracts increase the contractor's willingness to talk to the customer. His final comment was that the government should "incentivize" early milestones since the first six months of a project, usually, drive the downstream like a lever.

e. Individual 7, Company C, Project Manager, Comments: The detailed level of specifications cause contractors many problems, and the fact that the government won't allow a management reserve creates more hardships for the corporate project manager.

f. Individual 12, Company C, Industrial Relations, Comments: What is needed is a good contract structure that clearly lays out the objectives with good specifications. When this company was having financial difficulties, motivation was very high because everybody had a common goal, survival.

g. Individual 17, Company C, Contract Officer, Comments: In the area of uncertainty, set a reasonably realizable goal and incentivize above that level and don't punish us if we come up short.

h. Individual 18, Company C, Vice President Development, Comments: Deemphasize the legal jargon in contracts and effectively communicate to the contractor what it is that you want. Specifications for the Wright Brother's airplane amounted to less than two pages, now specs for a plane fill two boxcars.

i. Individual 21, Commission on Government Procurement, Deputy Director, Comments: If you know enough to properly structure an incentive contract, why don't you use a firm fixed price contract? I think incentive contracts are used as a sort of "cop-out" when we are too lazy to do our homework. The award fee contract looks very promising.

j. Individual 22, Navy Regional Procurement Office Los Angeles, Contract Officer, Comments: There is no bad type of contract, only bad usage. Cost plus award fee (CPAF) offers a logical approach to many procurements not suitable for fixed price, fixed price incentive, or cost plus incentive fee situations. A well structured CPAF motivation pattern

and good administration thereof, makes government managers manage their contracts and brings about a contractor/government interface relationship of a higher than otherwise level through:

(1) higher level of definition of performance difficulties and problem areas;

(2) more frequent exchange of information;

(3) higher echelons of both contractor and government become involved earlier; both informed and given an opportunity to act;

(4) cognizant personnel of both contractor and government organizations are brought together in a common team effort when it is clearly understood that BOTH have the same motivation, better performance.

k. Individual 23, USN, Navy Project Manager, Comments: If only profit is the motive, the product will not be good.

l. Individual 32, Naval Postgraduate School, Professor, Comments: The Production Manager is the real cost tracker. An incentive is essentially protection. Incentives are not essential to motivate, there are numerous other motivations; the main thing a manager must be concerned with is that he doesn't demotivate. Loyalty is the key and everybody is loyal to somebody.

C. EVALUATION OF DATA

The overwhelming answer that incentives from government contracts are definitely not passed down to personnel in corporations seems pertinent. This fact in connection with

the answers provided indicating that there seems to be no profit maximization scheme on corporate levels, provide much fruit for thought. If the incentive fee is not treated as an incentive, but as profit, as several individuals have indicated, and if there is no corporate, profit maximization scheme, then the use of an incentive fee to motivate the contractor toward better performance becomes questionable. Since there is no profit maximization scheme on a corporate basis, then possibly the government's thinking that all companies are only profit motivated is outmoded. Perhaps the government should look for other incentives or experiment with new methods of applying the incentive fee which would provide an actual incentive for a company.

The consensus of opinion was that the greatest incentive for the working man was the paycheck, and as you go up through the levels of the corporation, other things, such as job satisfaction and peer approval, become more important. The government must not become over engaged in corporate affairs, thus providing various incentives at various levels within a corporation is a complex task. To comply with DOD engagement policy, it seems necessary to provide top management with an incentive that will motivate it to in turn provide the necessary incentives for lower corporate levels.

If all contracts are administered the same regardless of type, as the data imply, then possibly the government's attempt to provide incentive type contracts is wrong, since they may not elicit the desired response from the contractor.

There seems to be total agreement that the first period of a contract, during which such things as staffing, getting the specifications out, and getting the drawings out, is the most important part of a contract, since it drives the performance of later portions of the contract. The government seems to recognize this fact, but really has failed to do anything to emphasize the importance of the period.

A final recurring theme that was noted from these interviews as well as from numerous speakers is the need for mutual trust between the government and contractors, and the need for the government to provide more functional specifications which allow the contractor more freedom to provide what the government wants. This freedom essentially requires trust also.

These seem to the authors to be the most important points obtained from these interviews and questioning of various individuals. From these data, the authors developed a proposal which they think will add new life to incentive contracts. This proposal will be presented in the next chapter.

V. RECOMMENDATIONS

A. INTRODUCTORY REMARKS

To date, the authors have been unable to satisfactorily respond to one individual who said, "If you know enough to properly structure an incentive contract, why don't you use a firm fixed price contract?" One possible response might be that there is not always the time to eliminate enough of the unknowns to enable one to use the firm fixed price contract. In other words, one does not always know exactly what it is that is wanted at the time of contract award. Another individual advised that a contract should never be signed before one knows what is wanted. It might appear that the authors are heading toward a recommendation that the government should do more homework. But that would not really be a recommendation, it would only be restating a problem. The authors realize that the procurement process offers numerous problems and have no visions of correcting all of them. Thus the authors have accepted the notion that there is an appropriate time for use of an incentive contract, and hope to follow the advice of Helen Peak, quoted earlier as saying, "We, too, (psychologists) need to refine our reagents and select them in light of the structure with which we are working."³⁵ The main purpose of this thesis has been

³⁵ Peak, "Attitude and Motivation," op. cit., p. 160.

to refine one reagent, the incentive contract. This refinement will draw heavily upon psychological motivation theories.

B. THE REFINEMENT

The authors recommend an incentive in the form of award fees spaced at appropriate intervals throughout the life of the contract. These fees should be based upon the accomplishment of measurable milestones.

The authors spent considerable time evaluating their proposed refinement to incentive contracts from a great many aspects. The final evaluation as to the legality was provided by Captain L. E. Hopkins (USN), Chairman of the ASPR Committee. There is, in fact, no legal reason, according to Captain Hopkins, why such a change could not be implemented.

Contractors and government personnel in the procurement area recognize that the most important time period of a contract, as far as determining success or failure, is the first few months. If this period is so important, the authors propose that this period be incentivized by an award fee arrangement based upon accomplishment of measurable milestones.

If you, as do the authors, accept the theory that to motivate is to make some behavior more probable, then it is important that certain conditions be followed. Harold F. Rothe, in an article entitled "Does Higher Pay Bring Higher Productivity?,"³⁶ indicates that the motivational process

³⁶ Rothe, "Does Higher Pay Bring Higher Productivity?," op. cit..

requires that there be:

1. A motive
2. An incentive appropriate to the motive, recognized as being related to the action, and certain of being applied immediately as soon as the correct action has been successfully completed.

Current incentive contract methods do not meet all these requirements. The authors have previously indicated that motives are numerous. But there is a motive or the contractor would not have bid in the first place. The authors feel that they can improve the understanding of what is to be done and their award fee proposal differs somewhat from the standard award fee. Award fees are generally based on subjective evaluation of how well the contractor has performed during a certain time frame. The authors recommend that the award fee be based on an objective evaluation. The proposal would require the government to set up some identifiable goals upon which to award this incentive at the end of the period. Certainly, this would require the government to do its homework in greater detail. Requiring the government to do its homework earlier and more thoroughly would force it together with the contractors to determine those items which both consider to be important. These items could then be made into measurable milestones for objective evaluation. When this is accomplished, both the government and the contractor will have goals more closely aligned, and both will know what the other expects. Alignment of goals, in the authors' opinion, will improve the effectiveness and likelihood of government contracting.

Is the incentive appropriate to the motive? By statute limitations, a contractor cannot receive more than 15 percent (of target cost) profit on research and development or 10 percent on production contracts. Dowling and Sayles contend that money as a motivator of individuals begins with the 20 percent increase.³⁷ The authors do not think of their proposed fee as an incentive in itself, however, and feel that the current limits need not be altered to accomplish the refinement of the incentive contract.

From the data presented on administration of various type contracts, it is doubtful that the incentive is recognized as being related to the action. However, with the objective award fee contract, this problem could be eliminated.

Current incentive contracts do not award the incentive immediately after the completed action in the authors' opinion. With the time span from beginning to end of a contract being any number of years, the action at the critical stage of the contract is not perceived as being related to the reward years later. The authors feel that immediate reward at the end of the first few months is a must.

This proposal would better ensure that those items early in a contract which the government thinks are necessary for successful completion of the contract will be accomplished. This, the authors feel, would require the government to determine just what items are important at this stage of the contract.

³⁷ Dowling and Sayles, How Managers Motivate, op. cit., p. 27.

Some of the items proposed by the authors are:

1. Staffing key personnel in key positions.
2. Subsystem specifications disseminated.
3. Drawings completed and released.
4. Procurements placed.
5. Experimental test completed.

From the contractors' viewpoint, this type of a structure does several things which are both good for the Project Manager and in turn good for the government. An award fee after the first few months of a contract gets the attention of the Corporate Management and would enable the Project Manager to get the key personnel he needs and put them in the proper positions. Corporate Management has previously looked at contract payoffs as something far in the future, but this would force them to look at it early. Early recognition seemed to be very important to the Project Managers interviewed. At the project managers' level, he would have a tool which he could use to motivate his personnel. Through interviews the authors formulated the opinion that personnel working on the specifications and drawings were viewed as necessary, but in most cases, they were not made to feel that they were a part of the project team. With this structure, the Project Manager can show them that they are important and fulfill some of their higher level needs such as recognition and job satisfaction. As can be seen, this approach would provide incentives for at least three levels within the corporation without excessive government engagement. The main concern, however, is that the government gets what it wants on time

and within cost. This early portion of the contract must be done well to ensure success in fulfilling the entire contract.

After this initial period, the authors propose that a second period be incentivized by another award fee. Here again the award fee does certain things for the government. It allows the government to evaluate its objectives and see if the original approach is still the desired approach or if some other approach would be better.

This would also require the government to determine what is important during this period of time.

From the contractors viewpoint, it provides similar considerations as during the previous period. It maintains corporate management's attention and yet allows the Project Manager to use this as a tool to motivate those persons whose tasks are of utmost importance during this period.

The authors feel that this method could be continued by breaking the contract into various period and incentivizing what is deemed important in each period with an award fee.

VI. CONCLUSIONS

There is mounting evidence that the Defense Department must tighten its belt and become more efficient if it is to fulfill its future mission. Efficient procurement of new weapon systems is therefore of utmost importance. Problems in the procurement area alone have prompted the creation of a special department within the Government Accounting Office to monitor Defense Department system acquisitions. More recently, the Congress has appointed a Commission on Government Procurement tasked with recommending methods to promote the economy, efficiency, and effectiveness of procurement.

This thesis has attempted to apply motivational theory to the refinement of one procurement tool, the incentive contract.

The authors recognize that weaknesses may exist in their arguments due to the limitation of research resources and the complexity of topic. The data here are insufficient to make sweeping changes in contracting procedures. However, from the limited data collected, there is strong evidence that has led the authors to draw the following conclusions:

1. Incentives from incentive contracts are not passed down to the various levels within a company.

2. Motivational programs do not vary greatly from company to company, the main difference being the emphasis on elements of the motivational program. For example, Company A

may place more emphasis on pay while Company B concentrates more heavily on personal recognition for superior performance, but both companies make use of both of these elements.

3. Administratively speaking, all contracts are alike in the eye of the contractor.

4. The corporate Project Manager is the first to know that an overrun will occur.

5. There is not a corporate program of trade-offs designed to maximize corporate profit, but profit maximization on the project level is practiced.

The authors would like to see more research in this area. If this thesis does nothing more than stimulate thought in this area, the authors feel it will have been successful.

VII. SUMMARY

This thesis has looked at some of the problems that exist in government contracting as well as several psychological theories on motivation. The authors have attempted to show that incentives from the contractors' and the government's viewpoints tend not to be the same. To show this the authors explained their approach to gathering the data necessary to make the conclusions, and explained why they used the interview technique to gather these data. After evaluating these data, the authors made the recommendation that an objective award fee system be set up to incentivize the contractor in various periods of a contract. They attempted to show that once the government and the contractor have determined what are important milestones to be incentivized in each period, then the government and the contractor goals may become more congruent. When this happens, the chances of success, in the authors' opinion, are greatly increased.

APPENDIX A

BRIEF DESCRIPTION OF INCENTIVE SYSTEMS

Incentives have been categorized into three types:³⁸

1. Individual--individual systems are of three main types:

a. piecework--individual receives an identical amount for each unit of output.

b. shared gains--he receives a proportion of the value of his output beyond a standard amount.

c. variable return--receives amounts per unit which differ according to his level of output.

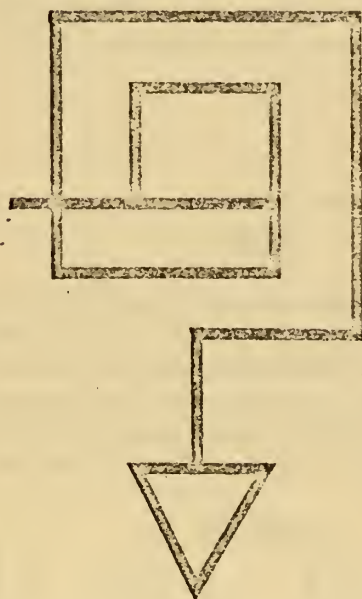
2. Group--under the group system, the earnings of a group of men, such as a work crew, are pooled and each receives a proportion of the value of any output beyond a standard amount for that group.

3. Collective--these systems include profit sharing, deferred compensation bonuses, stock purchase options, etc..

³⁸ Sills, D. L. (ed.), International Encyclopedia of the Social Sciences, v. 7, p. 248, Macmillan, 1968.

CIVILIAN PERSONNEL MANAGEMENT

SELF EVALUATION



Employee
Questionnaire

INSTRUCTIONS

This questionnaire is part of an evaluation of the civilian personnel program at this activity—to learn how well it is meeting your needs in addition to the needs of the activity and whether there are areas in which the program can be improved.

We would like to know what your experience has been with this program and how you feel about certain aspects of your own work situation. We know no better way to do this than to ask you directly, through a questionnaire such as this.

All that is required is that you read each statement carefully, decide how you feel about it, and mark the block on the answer sheet that best reflects this feeling.

You will undoubtedly agree with some of the statements, disagree with others. You will probably be undecided about some, or find they don't apply to your situation. If so, mark the "?" box, and go on to the next statement. Some of the statements may not be worded exactly as you would like, or may be of the type you would prefer to answer "sometimes yes and sometimes no." In these instances answer in the way that expresses your feeling MOST of the time. If it's more "yes" than "no," mark "yes." If it's more "no" than "yes," mark "no." Mark only ONE block for each statement.

All responses are VOLUNTARY and completely CONFIDENTIAL. Therefore please DO NOT SIGN YOUR NAME. Your answer sheet together with the others from this activity will be sent to the Navy Office of Civilian Manpower Management for processing by automated equipment. Computers will summarize the answers in statistical form so individual responses can't be identified. The summaries will be returned to your activity for analysis and appropriate action.

We hope you will take a personal interest—perhaps self-interest—in giving information to assist in improving the personnel program for Navy employees at your activity.

NOTE

Make only ONE mark for each answer.

Use ordinary pencil—No. 2 is preferred if available.





DO NOT use pen and ink, ballpoint or crayon.

Do not make any additional or stray marks on answer sheet.

In making corrections, erase COMPLETELY.

Do not fold, bend, or write in questionnaire booklet.

EXAMPLE

			
Right way	Wrong way	Wrong way	Wrong way

Line up this bar with bar on answer sheet .

1. MY SKILLS AND ABILITIES ARE BEING WELL USED IN MY PRESENT JOB
2. I HAVE REVIEWED MY JOB (POSITION) DESCRIPTION IN THE LAST YEAR
3. THE SAME PEOPLE SEEM TO GET THE BEST ASSIGNMENTS AND PROMOTIONS
4. I AM DOING A BETTER JOB BECAUSE OF THE TRAINING I HAVE RECEIVED AT THIS ACTIVITY
5. I AM FREE TO SUBMIT A COMPLAINT, GRIEVANCE OR APPEAL WITHOUT IT BEING HELD AGAINST ME
6. RULES AND REGULATIONS I AM EXPECTED TO FOLLOW ARE AVAILABLE TO ME IN WRITING
7. I WOULD RATHER GO TO A UNION REPRESENTATIVE OR SOMEONE
OTHER THAN MY SUPERVISOR IF I HAD A COMPLAINT
8. I AM BETTER PREPARED FOR PROMOTION BECAUSE OF TRAINING I HAVE RECEIVED AT THIS ACTIVITY
9. THE QUANTITY AND QUALITY OF WORK EXPECTED FROM MINORITY
GROUP MEMBERS IS THE SAME AS FOR ALL OTHER EMPLOYEES
10. RECREATIONAL FACILITIES AND ARRANGEMENTS ARE ALL RIGHT
11. MY SUPERVISOR USUALLY GIVES ME CREDIT WHEN I DO A GOOD JOB
12. MY JOB (POSITION) DESCRIPTION PRETTY WELL DESCRIBES WHAT I DO
13. I GET FAIR CONSIDERATION FOR THE BETTER JOBS I APPLY FOR
14. THERE ARE OPPORTUNITIES AT THIS ACTIVITY FOR SELF DEVELOPMENT AND IMPROVEMENT
15. DISCIPLINARY MEASURES, WHEN TAKEN AT THIS ACTIVITY, ARE FAIR AND WITHIN REASON
16. I HAVE JUST AS GOOD A CHANCE OF GETTING AHEAD AS ANY OTHER EMPLOYEE HERE
17. MY SUPERVISOR KEEPS ME PRETTY WELL INFORMED OF HOW I AM DOING MY JOB
18. I DO TOO MUCH LOWER LEVEL WORK THAT SHOULD BE GIVEN OTHERS TO DO
19. WE NEED AN EMPLOYEE GROUP OR OTHER ORGANIZATION TO PROTECT OUR RIGHTS
20. I WOULD MIND WORKING FOR A SUPERVISOR WHO IS A MEMBER OF A MINORITY GROUP
21. MEDICAL AND HEALTH FACILITIES ARE ACCEPTABLE
22. I CAN GET HELP FROM MY SUPERVISOR WHENEVER I NEED IT
23. THE PAY FOR MY JOB IS ABOUT RIGHT FOR THE WORK I DO
24. PROMOTIONS USUALLY GO TO THE BEST QUALIFIED
25. I HAVE RECEIVED ALL THE TRAINING I NEED TO DO MY JOB

Line up this bar with bar on answer sheet

26. MY SUPERVISOR ENCOURAGES ME TO SUBMIT BENEFICIAL SUGGESTIONS
27. I KNOW WHEN AND WHERE THERE ARE JOB OPENINGS THAT I MAY APPLY FOR AT THIS ACTIVITY ..
28. EVERYONE DOES HIS FAIR SHARE OF THE WORK IN MY UNIT
29. UNION MEMBERS ARE TREATED THE SAME AS NON-UNION MEMBERS
30. AS FAR AS JOB OPPORTUNITIES ARE CONCERNED, MEN AND WOMEN ARE TREATED THE SAME
31. I AM FREE TO DISCUSS WORK IMPROVEMENTS WITH MY SUPERVISOR
32. MY PAY IS FAIR COMPARED TO THE PAY OTHERS ARE GETTING
33. I AM TOLD PROMPTLY WHEN THERE IS A CHANGE IN POLICY, RULES
OR REGULATIONS THAT AFFECT ME
34. THIS PLACE WOULD RUN BETTER IF IT WERE ORGANIZED DIFFERENTLY
35. TRANSPORTATION FACILITIES ARE O.K.
36. I HAVE FREEDOM TO DO THINGS MY OWN WAY, WITHIN REASON
37. I THINK THEY LEAN OVER BACKWARDS TO GIVE MINORITY GROUP MEMBERS ALL THE BREAKS
38. I HAVE A CHANCE TO MAKE MY VIEWS KNOWN BEFORE CHANGES ARE MADE THAT AFFECT ME
39. I UNDERSTAND HOW MY JOB FITS INTO THE WORK OF THIS ACTIVITY
40. MEMBERS OF MINORITY GROUPS ARE TREATED FAIRLY AT THIS ACTIVITY
41. BULLETIN BOARDS KEEP ME INFORMED OF THINGS I NEED TO KNOW
42. THE TITLE OF MY JOB IS ABOUT RIGHT FOR THE WORK I DO
43. GETTING TRAINING IS IMPORTANT IF YOU WANT TO BE PROMOTED
44. I AGREE WITH THE LAST PERFORMANCE RATING I RECEIVED
45. I USUALLY CAN TAKE LEAVE WHEN I WANT IT
46. I AM SATISFIED WITH THE PROGRESS I HAVE MADE AT THIS ACTIVITY
47. THE TRAINING I HAVE RECEIVED AT THIS ACTIVITY HAS HELPED ME ADVANCE
48. I GENERALLY KNOW WHAT IS GOING ON AT THIS ACTIVITY
49. I AM FREE TO JOIN A UNION IF I WANT TO
50. I KNOW HOW THE PAY FOR MY JOB IS SET
51. I KNOW HOW TO GET MY CLASSIFICATION REVIEWED

Line up this bar with bar on answer sheet 

52. I UNDERSTAND HOW THEY PICK PEOPLE FOR PROMOTION
53. I DO A LOT OF UNNECESSARY WORK
54. I KNOW WHAT I'M EXPECTED TO DO IN MY JOB
55. MY SUPERVISOR TRIES TO GET MY IDEAS ABOUT THINGS
56. I GET PERSONAL SATISFACTION FROM MY JOB
57. I AM TREATED FAIRLY AND WITH RESPECT
58. PARKING FACILITIES ARE SATISFACTORY
59. THE WORK I DO IS INTERESTING
60. I AM TOO CLOSELY SUPERVISED
61. I KNOW THE QUALITY OF WORK EXPECTED OF ME
62. EATING FACILITIES ARE SATISFACTORY
63. THE WORK I DO IS IMPORTANT
64. I KNOW HOW MUCH WORK IS EXPECTED OF ME
65. I WOULD RECOMMEND THIS PLACE TO MY FRIENDS
AS A GOOD PLACE TO WORK

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LIST OF REFERENCES

BOOKS

1. Brethower, D. N., A Total Performance System, Behaviordelia, Inc., 1972.
2. Dowling, W. F., Jr. and Sayles, L. R., How Managers Motivate: The Imperatives of Supervision, p. 7, McGraw-Hill Book Company, 1971.
3. Halperin, M. H., "The Evolution of American Military Strategy," in Smith, M. E., III and Johns, C. J., Jr. (ed.), American Defense Policy, 2d ed., p. 176, the Johns Hopkins Press, 1968.
4. Herzberg, F., Mausner, B., and Snyderman, B. B., "Motivation Versus Hygiene," in Sutermeister, R. A. (ed.), People and Productivity, p. 492-497, McGraw-Hill Book Company, Inc., 1963.
5. Opsahl, R. S. and Dunnette, M. D., "The Role of Financial Compensation in Industrial Motivation," in Cummings, L. L. and Scott, W. E., Jr., Readings in Organizational Behavior and Human Performance, p. 499-527, Richard D. Irwin, Inc., and the Dorsey Press, 1969.
6. Peak, H., "Attitude and Motivation," in Cummings, L. L. Scott, W. E., Jr., Readings in Organizational Behavior and Human Performance, p. 159-166, Richard D. Irwin, Inc. and the Dorsey Press, 1969.
7. Porter, L. W. and Lawler, E. E., III, "Properties of Organization Structure in Relation to Job Attitudes and Job Behavior," in Cummings, L. L. and Scott, W. E., Jr., Readings in Organizational Behavior and Human Performance, p. 402-433, Richard D. Irwin, Inc., and the Dorsey Press, 1969.
8. Rothe, H. F., "Does Higher Pay Bring Higher Productivity?," in Sutermeister, R. A. (ed.), People and Productivity, p. 257-265, McGraw-Hill Book Company, Inc., 1963.
9. Sills, D. L. (ed.), International Encyclopedia of the Social Sciences, v. 7, p. 248-249, Macmillan, 1968.
10. Wassenaar, D. J. and Oestreich, H. H., The Hawthorne Studies A Summary and Critical Evaluation, San Jose State College, San Jose, California, The Lansford Publishing Company, 1972.

REPORTS

1. The Budget of the United States Government Fiscal Year 1973, p. 75, U. S. Government Printing Office, Washington, 1972.
2. Commission on Government Procurement, Summary of the Report of the Commission on Government Procurement, p. III-IV, U. S. Government Printing Office, December 1972.
3. Harbridge House, Inc., Basic Graphics for Incentive Contracting, p. 1, Harbridge House, Inc..
4. Rand Corporation Report RM-5700-PR, A Reappraisal of Incentive Contracting Experience, by I. N. Fisher, July, 1968.
5. Rand Corporation Report RM-5120-PR, Cost Incentives and Contract Outcomes: An Empirical Analysis, by I. N. Fisher, September 1966.
6. Rand Corporation Report RM-2948-PR, Military Procurement and Contracting: An Economic Analysis, by F. T. Moore, June 1968.
7. Rand Corporation Report P-3870, Improving the Effectiveness of Incentiveness Contracting, by I. N. Fisher, July 1968.
8. Rand Corporation Report P-4404, Optimal Incentive Contracting: A Constrained Game Theory Model, by J. L. Midler, June 1970.
9. Rand Corporation Report RM-5122-PR, A Method for Selecting Contract Cost Incentives, by R. E. Miller, March 1967.
10. Rand Corporation Report RM-5019-PR, Notes on Incentive Contracting, by K. L. Deavers and J. J. McCall, September, 1966.
11. Rand Corporation Report RM-4231-PR, Risk-Aversion in Incentive Contracting: An Experiment, by G. J. Geeny and Others, August 1964.
12. Rand Corporation Report P-3191, A Note on Incentive Fee Contracting, by R. M. Thrall, August 1965.
13. Army Command and General Staff College, An Analysis of Incentive Contracts with Respect to Risk, J. E. Jones, 1971.
14. Survey of Procurement Statistics, by Department of the Navy Headquarters Naval Material Command, June 1972.

THESES

1. CDR Dixon, M. W., A Statistical Analysis of Deviations from Target Cost in NAVAIRSYSCOMHQ Fixed-Price Incentive During the 1949-1965 Time Frame, M. S. Thesis, Naval Postgraduate School, Monterey, California, March 1973.
2. Redden, E. G., The Use of Incentive Contracting in Aircraft Procurement, M. S. Thesis, Naval Postgraduate School, Monterey, California, 1965.

ADDRESSES

1. Bell, H., Deputy Director of Procurement and System Acquisition Division GAO, Address at the Naval Postgraduate School, December 1972.
2. Frosch, R. A., Assistant Secretary of the Navy for Research and Development, Address at the Association of Senior Engineers Annual Technical Symposium Banquet, 28 March 1969, Readings in Acquisition Management for Period of 1969 to 1972, Compiled by CDR DeMayo, P., p. 302-324, Naval Postgraduate School Print Shop, June 1972.
3. Frosch, R. A., Assistant Secretary of the Navy for Research and Development, Address at the Sixteenth Annual Institute on Government Contracts, George Washington University/Federal Bar Association, Washington, D. C., 8 May 1969, Readings in Acquisition Management for Period of 1969 to 1972, Compiled by CDR DeMayo, P., p. 325-345, Naval Postgraduate School Print Shop, June 1972.
4. Hunt, R. G., "Extra-Contractual Incentives in the Award Fee," Address at the School of System and Logistics Air Force Institute of Technology Wright-Patterson AFB, Ohio, 23-24 February 1972, Proceedings DOD Procurement Symposium: Progress and Research in the Seventies, p. 75-110, February 1972.
5. Judson, R., Deputy Director of the Commission on Government Procurement, Address at the Naval Postgraduate School, 18 July 1973.
6. Kidd, I. E., Jr., Chief of Naval Material, "The Three R's: Reliability, Responsibility, and Reason," Address to the Naval Air Systems Command's Monthly Luncheon, Fort Myer Officer's Club, 16 February 1972, Readings in Acquisition Management for Period of 1969 to 1972, Compiled by CDR DeMayo, P., p. 603-622, Naval Postgraduate School Print Shop, June 1972.

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